

WHAT IS CLAIMED IS:

1 1. A method for generating electrical power from low frequency,
2 vibrational energy, the method comprising:
3 receiving vibrational energy having a low frequency;
4 converting the low frequency, vibrational energy to vibrational
5 energy having a high frequency greater than the low frequency; and
6 converting the high frequency, vibrational energy to electrical power.

1 2. The method as claimed in claim 1, wherein the step of
2 converting the high frequency, vibrational energy is performed piezoelectrically or
3 electrostatically or electromagnetically.

1 3. The method as claimed in claim 1, wherein the low frequency
2 is in the range of 1 to 100 Hz.

1 4. The method as claimed in claim 3, wherein the low frequency
2 is in the range of 1 to 10 Hz.

1 5. The method as claimed in claim 1, wherein the step of
2 converting the low frequency, vibrational energy is performed mechanically.

1 6. The method as claimed in claim 1, wherein the step of
2 receiving the low frequency, vibrational energy includes the step of providing a
3 micromechanical first resonator device, the first resonator device resonating in
4 response to the received vibrational energy.

1 7. The method as claimed in claim 6, wherein the first resonator
2 device has a mechanical resonance frequency in the range of 1 to 100 Hz.

1 8. The method as claimed in claim 6, wherein the step of
2 converting the low frequency, vibrational energy includes the step of providing a

micromechanical second resonator device, the second resonator device resonating at the high frequency in response to the resonating first resonator device.

9. The method as claimed in claim 7, wherein the second resonator device has a mechanical resonance frequency in the range of 1 to 10 kHz.

10. The method as claimed in claim 8, wherein the second resonator device includes an array of micromechanical resonators.

11. A micro power generator for generating electrical power from low frequency, vibrational energy, the generator comprising:
means for receiving vibrational energy having a low frequency;
means for converting the low frequency, vibrational energy to vibrational energy having a high frequency greater than the low frequency; and
means for converting the high frequency, vibrational energy to electrical power.

12. A micro power generator for generating electrical power from low frequency, vibrational energy, the generator comprising:
a micromechanical first resonator device which resonates in response to the vibrational energy;
a micromechanical second resonator device; and
a circuit coupled to the resonator devices for coupling the resonator devices together so that the second resonator device resonates at a high frequency greater than the low frequency when the first resonator device resonates, the circuit also converting the high frequency, vibrational energy to electrical power.

13. The generator as claimed in claim 12, wherein the high frequency, vibrational energy is converted electromagnetically.

14. The generator as claimed in claim 12, wherein the low frequency is in the range of 1 to 100 Hz.

1 15. The generator as claimed in claim 14, wherein the low
2 frequency is in the range of 1 to 10 Hz.

1 16. The generator as claimed in claim 12, wherein the conversion
2 of the low frequency, vibrational energy is performed mechanically.

1 17. The generator as claimed in claim 12, wherein the circuit
2 includes a magnet and at least one coil which moves relative to the magnet and
3 wherein voltage is induced on the at least one coil by electromagnetic induction.

1 18. The generator as claimed in claim 17, wherein the first
2 resonator device has a mechanical resonance frequency in the range of 1 to 100 Hz.

1 19. The generator as claimed in claim 17, wherein at least one of
2 the magnet and the at least one coil is mechanically coupled to the resonator devices
3 so that the magnet and the at least one coil move relative to one another to generate
4 voltage on the at least one coil.

1 20. The generator as claimed in claim 18, wherein the second
2 resonator device has a mechanical resonance frequency in the range of 1 to 10 kHz.

1 21. The generator as claimed in claim 19, wherein the second
2 resonator device includes an array of micromechanical resonators and wherein each
3 of the resonators has a coil formed thereon.